

Appl. No. : 10/030,732  
Filed : January 8, 2002

### AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** A process for producing a porous metal body, comprising:

(1) maintaining under reduced pressure in the range between  $10^{-1}$  and  $10^{-6}$  Torr a raw metal material within a temperature range which is 50 to 200°C lower than the melting point of the metal in a sealed vessel to thereby degas the raw metal material;

(2) melting the raw metal material under pressurization of between 0.1 and 10 MPa by introducing a gas containing nitrogen gas and ~~optionally~~ one or more gases selected from the group consisting of hydrogen, argon, and helium into the sealed vessel to thereby dissolve the gas in the molten metal; and

(3) pouring the molten metal into a mold equipped with a cooling apparatus while controlling the gas pressure above and the temperature of the molten metal, cooling and solidifying the molten metal in the mold inside the sealed vessel to form a porous metal body.

2. **(Previously presented)** The process for producing a porous metal body according to claim 1, wherein the raw metal material is selected from the group consisting of iron, copper, nickel, cobalt, magnesium, aluminum, titanium, chromium, tungsten, manganese, molybdenum, beryllium and alloys comprising one or more of these metals.

3 -7 **(Canceled)**

8. **(Previously presented):** The process for producing a porous metal body according to claim 1, wherein the pressure applied in step (2) is between 0.2 and 2.5 MPa.

9. **(Canceled)**

10. **(Original):** The process for producing a porous metal body according to claim 1, wherein the cooling and solidification of the molten metal in step (3) is performed by a continuous casting method.

11. **(Previously presented):** The process for producing a porous metal body according to claim 1, wherein said gas is a nitrogen-argon mixture, a nitrogen-helium mixture or a nitrogen-argon-helium mixture.

12. **(Previously presented):** A method for producing a porous metal comprising:

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holding a metal under a pressure of between  $10^{-1}$  and  $10^{-6}$  Torr and at a temperature lower by 50 to 200°C than the melting point of the metal in a sealed vessel, thereby degassing the metal;

melting the metal under a pressure of between 0.1 and 10 MPa while introducing a gas mixture containing nitrogen gas and at least one gas selected from the group consisting of hydrogen, argon, and helium into the sealed vessel, thereby dissolving a part of the gas in the resultant molten metal; and

pouring the molten metal into a mold, and cooling and solidifying the molten metal in the mold to produce a porous metal.

**13. (Previously presented)** The method according to claim 12, wherein said gas mixture is a nitrogen-argon mixture, a nitrogen-helium mixture or a nitrogen-argon-helium mixture.

**14. (Previously presented)** The method according to claim 12, wherein the gas mixture contains hydrogen.

**15. (New)** A process for producing a porous metal body, comprising:

(1) maintaining under reduced pressure in the range between  $10^{-1}$  and  $10^{-6}$  Torr a raw metal material within a temperature range which is 50 to 200°C lower than the melting point of the metal in a sealed vessel to thereby degas the raw metal material;

(2) melting the raw metal material under pressurization of between 0.1 and 10 MPa by introducing a gas containing a nitrogen-argon mixture, a nitrogen-helium mixture or a nitrogen-argon-helium mixture into the sealed vessel to thereby dissolve the gas in the molten metal; and

(3) pouring the molten metal into a mold equipped with a cooling apparatus while controlling the gas pressure above and the temperature of the molten metal, cooling and solidifying the molten metal in the mold inside the sealed vessel to form a porous metal body.

**16. (New)** A method for producing a porous metal comprising:

holding a metal under a pressure of between  $10^{-1}$  and  $10^{-6}$  Torr and at a temperature lower by 50 to 200°C than the melting point of the metal in a sealed vessel, thereby degassing the metal;

melting the metal under a pressure of between 0.1 and 10 MPa while introducing a nitrogen-argon mixture, a nitrogen-helium mixture or a nitrogen-argon-

helium mixture into the sealed vessel, thereby dissolving a part of the gas in the resultant molten metal; and

pouring the molten metal into a mold, and cooling and solidifying the molten metal in the mold to produce a porous metal.

**17. (New)** A process for producing a porous metal body, comprising:

(1) maintaining under reduced pressure in the range between  $10^{-1}$  and  $10^{-6}$  Torr a raw metal material within a temperature range which is 50 to 200°C lower than the melting point of the metal in a sealed vessel to thereby degas the raw metal material;

(2) melting the raw metal material under pressurization of between 0.1 and 10 MPa by introducing a nitrogen gas into the sealed vessel to thereby dissolve the gas in the molten metal; and

(3) pouring the molten metal into a mold equipped with a cooling apparatus while controlling the gas pressure above and the temperature of the molten metal, cooling and solidifying the molten metal in the mold inside the sealed vessel to form a porous metal body.

**18. (New)** The process for producing a porous metal body according to claim 15, wherein the raw metal material is selected from the group consisting of iron, copper, nickel, cobalt, magnesium, aluminum, titanium, chromium, tungsten, manganese, molybdenum, beryllium, and alloys comprising one or more of these metals.

**19. (New)** The process for producing a porous metal body according to claim 15, wherein the pressure applied in step (2) is between 0.2 and 2.5 MPa.

**20. (New)** The process for producing a porous metal body according to claim 15, wherein the cooling and solidification of the molten metal in step (3) is performed by a continuous casting method.

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## **SUMMARY OF INTERVIEW**

### Exhibits and/or Demonstrations

Declaration of Hideo Nakajima

### Identification of Claims Discussed

1, 2, 8, and 10-14

### Identification of Prior Art Discussed

US 5,181,549; JP 3-17236, and JP 56-24693B2

### Proposed Amendments

The Examiner indicated that he would consider the claims favorably if we delete the term “optionally” from Claim 1. Other amendments such as a “certain direction” were discussed and the Examiner indicated that if the claims were amended in this manner and data were provided showing that the present invention provided superior results compared to the prior art in this regard that he would also consider such claims favorably in a continuation application. The Examiner also considered a willingness to consider claims reciting the specific partial pressures for each gas along with the temperatures in a Continuation.

### Results of Interview

Applicant agreed to amend Claim 1 as shown in the Claim amendments and to pursue the other claim amendments in one or more Continuation applications.